

**ABSTRACT**

The present disclosure relates to a spread spectrum measurement device with which a desired condition can be measured. In use, the spread spectrum measurement device is used to direct a spread spectrum signal into medium (*e.g.*, a patient's body),

5 detect a parameter that corresponds to the signal directed into the medium, generate a measured parameter signal from the detected parameter, and analyze the measured parameter signal to determine the desired condition. In one arrangement, a spread spectrum current signal is transmitted into the medium and a voltage signal is detected. From this voltage signal, an impedance signal is generated with which

10 electrode contact impedance, patient heart rate, and/or patient respiration rate can be measured.